dRICH update

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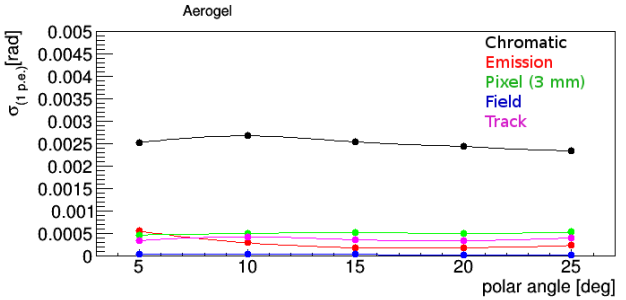
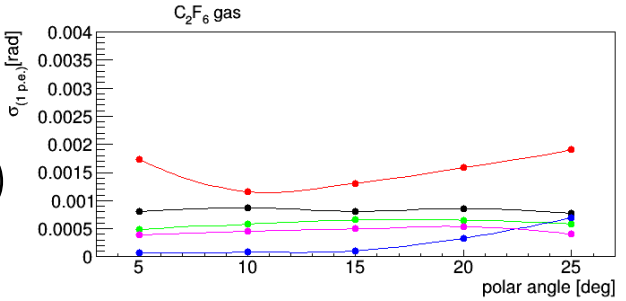
Apr, 23, 2018

New PID strategy

1) $IRT \rightarrow (\theta_C^M | track, rad)$





2) Each photon assigned to one track only, or bk

$$P_{track,rad}^{photon} = Gauss(\theta_C^M | \theta_C^T, \sigma_{\theta_C}) * \sum Pois(N_{pe}^M + 1, \langle N_{pe} \rangle)$$

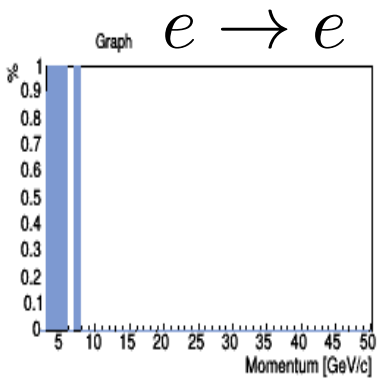
$$P_B = C * \sum Pois(N_{pe}^B + 1, \langle N_{pe}^B \rangle)$$

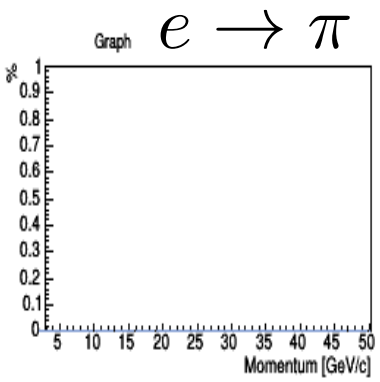
3) The max L privide the most probable PID configuration of the entire event

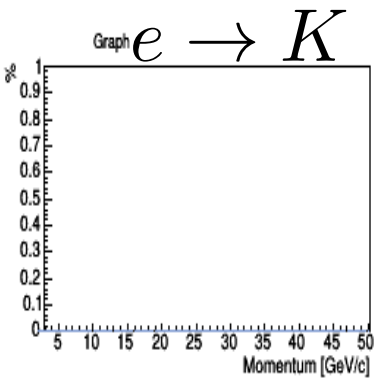
$$L = \sum_{track,rad} ln(Gauss(\theta_C^M | \theta_C^T, \sigma_{\theta_C}/\sqrt{N_{pe}}) * \sum Pois(N_{pe}^M + 1, \langle N_{pe} \rangle)) + ln(C^{N_{pe}^B} * \sum Pois(N_{pe}^B + 1, \langle N_{pe}^B \rangle))$$

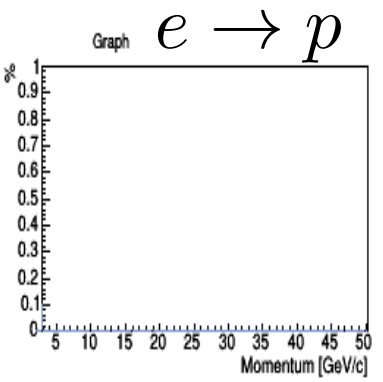
This is an IRT event based reconstruction now!

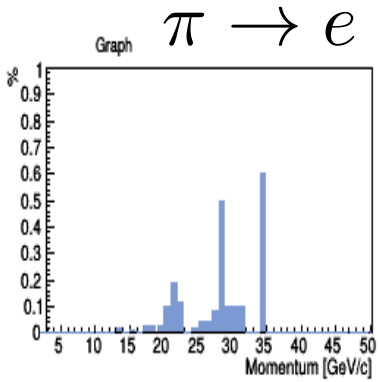
Note in preparation!

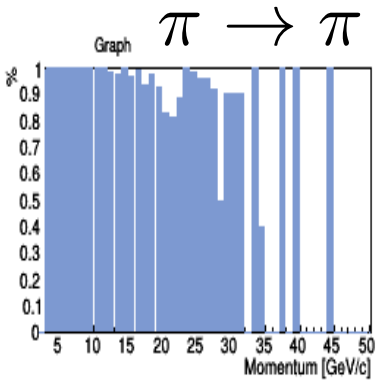

Graph
$e \to e$
%
Momentum [GeV/c]

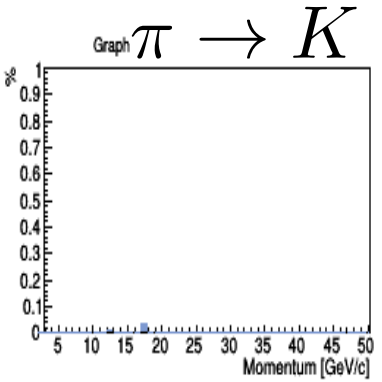

Graph
$e \to \pi$
%
Momentum [GeV/c]

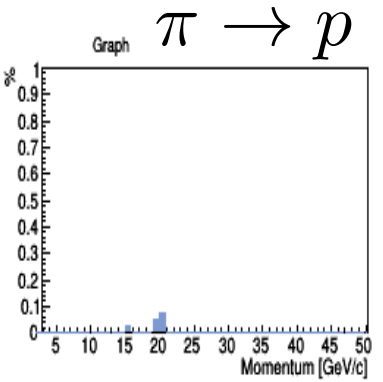

Graph
$e \to K$
%
Momentum [GeV/c]

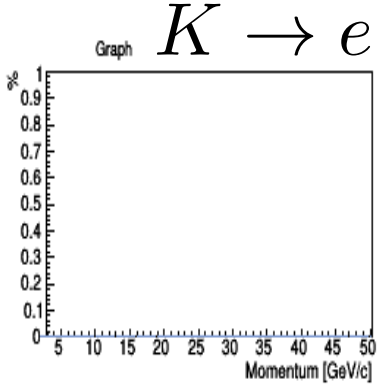

Graph
$e \to p$
%
Momentum [GeV/c]

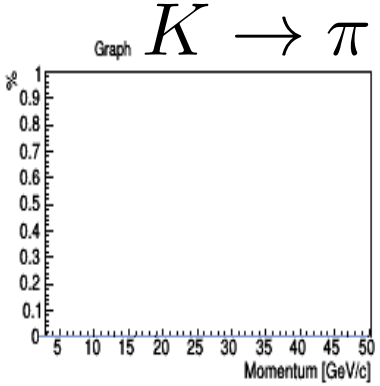

Graph
$\pi \to e$
%
Momentum [GeV/c]

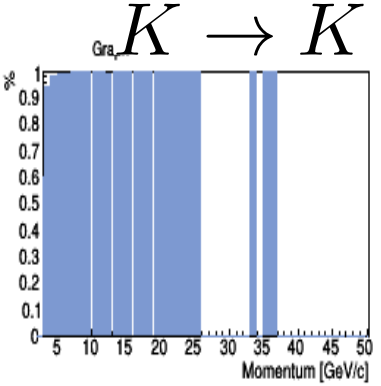

Graph
$\pi \to \pi$
%
Momentum [GeV/c]

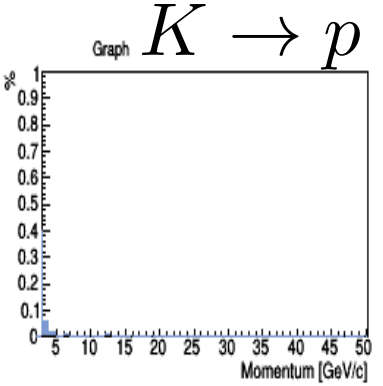

Graph
$\pi \to K$
%
Momentum [GeV/c]

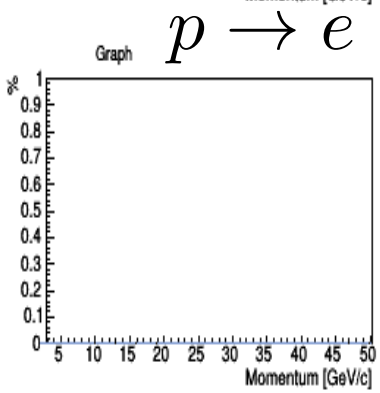

Graph
$\pi \to p$
%
Momentum [GeV/c]

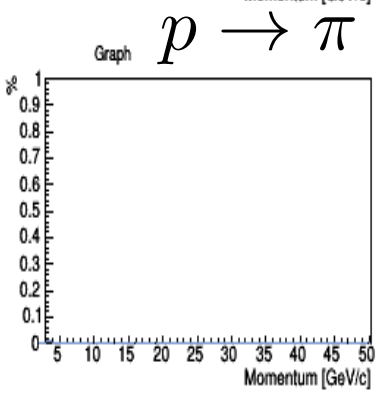

Graph
$K \to e$
%
Momentum [GeV/c]

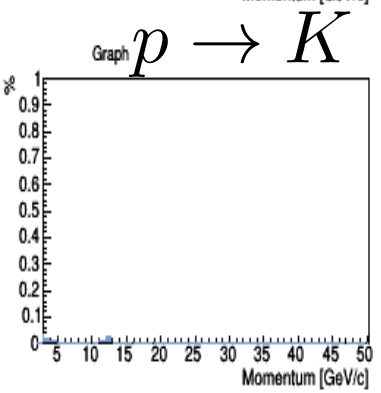

Graph
$K \to \pi$
%
Momentum [GeV/c]

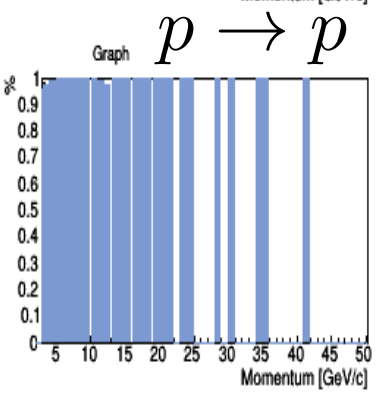

Gra
$K \to K$
%
Momentum [GeV/c]


Graph
$K \to p$
%
Momentum [GeV/c]


Graph
$p \to e$
%
Momentum [GeV/c]


Graph
$p \to \pi$
%
Momentum [GeV/c]


Graph
$p \to K$
%
Momentum [GeV/c]


Graph
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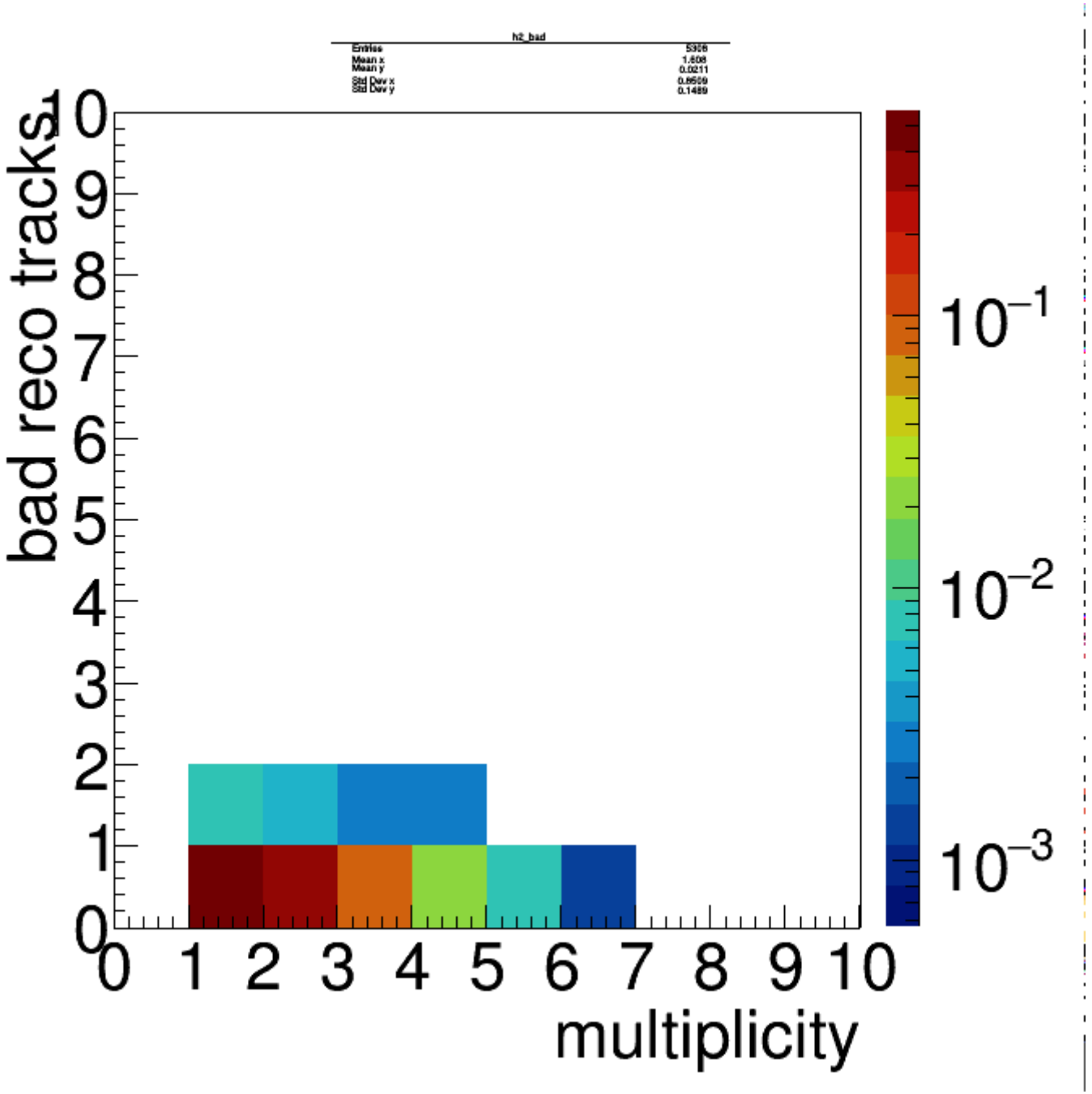
Momentum [GeV/c]


h2_bad
Entries 5306
Mean x 1.608
Mean y 0.0211
Std Dev x 0.8609
Std Dev y 0.1489
bad reco tracks
multiplicity
0 1 2 3 4 5 6 7 8 9 10
0 1 2 3 4 5 6 7 8 9 10
10^{-1}
10^{-2}
10^{-3}

Comments & to do

- 45000 events, multiplicity 2.4
- The dRICH works well, as expected by design

Working on ...

- dRICH report & publication

  - one on the dRICH simulation

  - one on the algorithm
- Synergy with Nils and others on BNL side